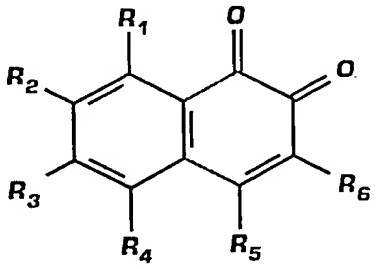
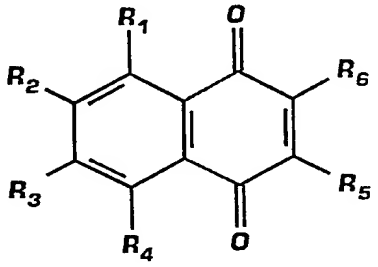
1-18. (CANCELED)

29. (WITHDRAWN)

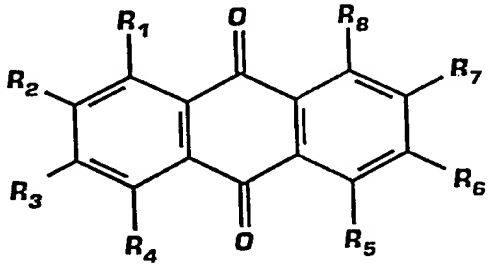
A nucleic acid oligomer modified by attaching a redox-active substance, characterized in that the redox-active substance is a compound having a predominantly planar p-π-orbital system, namely a 1,2-naphthoquinone of the general structure



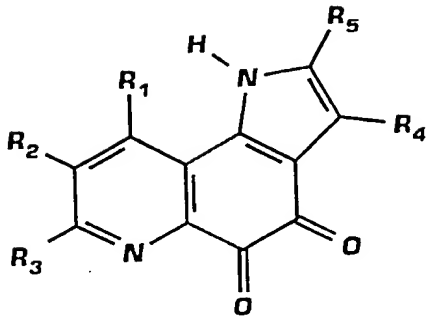
or a 1,4-naphthoquinone of the general structure



or a 9,10-anthraquinone of the general structure

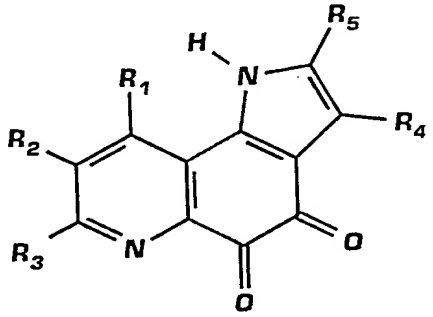


or a pyrrolo-quinoline quinone of the general structure



wherein R_1 to R_8 are, independently of one another, H or any alkyl, alkenyl, alkinyl, heteroalkyl, heteroalkenyl, or heteroalkinyl substituents.

30. (WITHDRAWN)
The modified nucleic acid oligomer according to claim 29 wherein the redox-active substance is a pyrrolo-quinoline quinone of the general structure



wherein R_2, R_4 = H and R_1, R_3, R_5 = COOH.

31. (WITHDRAWN)
The modified nucleic acid oligomer according to claim 29, wherein the redox-active substance is covalently attached to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

32. (WITHDRAWN)
The modified nucleic acid oligomer according to claim 29, wherein the redox-active substance is covalently attached to a branched or linear molecular moiety of any composition and chain length and the branched or linear molecular moiety is attached to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

33. (WITHDRAWN)
The modified nucleic acid oligomer according to claim 32 wherein the redox-active substance is covalently attached to a branched or linear molecular moiety whose shortest continuous link between the joined structures comprises 1 to 14 atoms.

34. (WITHDRAWN)
The modified nucleic acid oligomer according to claim 29, wherein the modified nucleic acid oligomer can sequence-specifically bind single-strand DNA, RNA, and/or PNA.

35. (WITHDRAWN)
The modified nucleic acid oligomer according to claim 34 wherein the modified nucleic acid oligomer is a deoxyribonucleic acid oligomer, a ribonucleic acid oligomer, a peptide nucleic acid oligomer, or a nucleic acid oligomer having a structurally analogous backbone.

36. (WITHDRAWN)
The method of producing a modified nucleic acid oligomer according to claim 29, characterized in that the redox-active substance is bound to a nucleic acid oligomer, the attachment occurring at a phosphoric-acid or carboxylic-acid group of the nucleic acid oligomer by means of amidation with a (primary or secondary) amino group of the redox-active substance, by means of esterification with a (primary, secondary, or tertiary) alcohol group of the redox-active substance, by means of thioester formation with a (primary, secondary, or tertiary) thioalcohol group of the redox-active substance, or by means of condensation of an amine group of the nucleic acid oligomer with an aldehyde group of the redox-active substance.

37. (WITHDRAWN)
The method of producing a modified nucleic acid oligomer according to claim 32, characterized in that the redox-active substance is covalently attached to a branched or linear molecular moiety of any composition and chain length, the attachment occurring at a phosphoric-acid or carboxylic-acid group of the branched or linear molecular moiety by means of amidation with a (primary or secondary) amino group of the redox-active substance, by means of esterification with a (primary, secondary, or tertiary) alcohol group of the redox-active substance, by means of thioester formation with a (primary, secondary, or tertiary) thioalcohol group of the redox-active substance, or by means of condensation of an amine group of the branched or linear molecular moiety with an aldehyde group of the redox-active substance.

38-43. (CANCELLED)

44. (WITHDRAWN)
The modified conductive surface according to claim 43, wherein one of the phosphoric-acid, carboxylic-acid, or amine moieties, one of the sugar moieties, or one of the bases of the nucleic acid oligomer is attached to the conductive surface covalently or by means of physisorption, especially to a terminal moiety of the nucleic acid oligomer.

45. (WITHDRAWN)
The modified conductive surface according to claim 38, wherein branched or linear molecular moieties of any composition and chain length are attached to the conductive surface, covalently or by means of physisorption, and the modified nucleic acid oligomers are covalently attached to these molecular moieties.

46. (WITHDRAWN)
The modified conductive surface according to claim 55, wherein the branched or linear molecular moiety comprises a shortest continuous link of 1 to 14 atoms between the joined structures.

47. (WITHDRAWN)
The modified conductive surface according to claim 45, wherein the branched or linear molecular moiety is covalently bound to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

48. (WITHDRAWN)
A method of producing a modified conductive surface according to claim 38, wherein one or more kinds of modified nucleic acid oligomers according to claims 1 to 7 are applied to a conductive surface.

49. (WITHDRAWN)
The method of producing a modified conductive surface according to claim 38, wherein one or more kinds of nucleic acid oligomers are bound to a conductive surface and only the nucleic acid oligomers bound to the conductive surface are modified by attaching a redox-active substance to the nucleic acid oligomers.

50. (WITHDRAWN)
The method of producing a modified conductive surface according to claim 49, wherein the attachment of the redox-active substance to the nucleic acid oligomer occurs by means of reacting the redox-active substance with a phosphoric-acid moiety, a sugar moiety, or one of the bases of the nucleic acid oligomer, especially by means of reaction with a terminal moiety of the nucleic acid oligomer.

51. (WITHDRAWN)
The method of producing a modified conductive surface according to claim 49, wherein the redox-active substance is covalently attached to a branched or linear molecular moiety of any composition and chain length and the branched or linear molecular moiety is attached to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

52. (WITHDRAWN)
The method of producing a modified conductive surface according to claim 48, wherein the nucleic acid oligomer or the modified nucleic acid oligomer is hybridized with the nucleic acid oligomer strand complementary to it and applied to the conductive surface in the form of the double-strand hybrid.

53. (WITHDRAWN)
The method of producing a modified conductive surface according to claim 48, wherein the nucleic acid oligomer or the modified nucleic acid oligomer is applied to the conductive surface in the presence of further chemical compounds that are likewise attached to the conductive surface.

54. (WITHDRAWN)
A method of electrochemically detecting nucleic acid oligomer hybridization events, characterized in that a conductive surface as defined in claim 38, is brought into contact with nucleic acid oligomers and, thereafter, detection of the change in the electrical communication between the redox-active moiety and the respective conductive surface resulting from the hybridization of the nucleic acid oligomers with the modified nucleic acid oligomers occurs.

55. (WITHDRAWN)
The method according to claim 54, wherein detection occurs by means of cyclic voltammetry, amperometry, or conductivity measurement.

56. (CURRENTLY AMENDED)
A method of producing a modified conductive surface, wherein a nucleic acid oligomer or a nucleic acid oligomer modified by attaching a redox-active substance that is selectively oxidizable and reducible at a potential φ with $2.0\ V \geq \varphi \leq -2.0\ V$, measured against normal hydrogen electrode, is hybridized with the nucleic acid oligomer strand complementary to ~~[[it]]~~ the nucleic acid oligomer or the modified nucleic acid oligomer and applied to a conductive surface in the form of the double-strand hybrid.

57. (PREVIOUSLY PRESENTED)

The method according to claim 56, wherein the double-strand hybrid is thermally dehybridized following application to the conductive surface.

58. (CURRENTLY AMENDED)

The method according to claim 56, wherein the double-strand hybrid is applied to the conductive surface in the presence of further chemical compounds ~~[[that are likewise]]~~ also attached to the conductive surface.

59. (CURRENTLY AMENDED)

A method of producing a modified conductive surface, wherein a nucleic acid oligomer or a nucleic acid oligomer modified by attaching a redox-active substance that is selectively oxidizable and reducible at a potential φ with $2.0\ V \geq \varphi \geq -2.0\ V$, measured against normal hydrogen electrode, is applied to the conductive surface in the presence of further chemical compounds ~~[[that are likewise]]~~ also attached to the conductive surface.

60. (CURRENTLY AMENDED)

A method of producing a modified conductive surface, wherein a nucleic acid oligomer or a nucleic acid oligomer modified by attaching a redox-active substance that is selectively oxidizable and reducible at a potential φ with $2.0\ V \geq \varphi \geq -2.0\ V$, measured against normal hydrogen electrode, is applied to the conductive surface in a buffer with no conducting salt added, to reduce electrostatic shielding of the nucleic acid oligomer, and thereafter, further chemical compounds ~~[[that are likewise]]~~ also attached to the conductive surface are applied to the conductive surface.

61. (WITHDRAWN)

The method according to claim 30, wherein the chemical compounds are alkyl, alkenyl, alkinyl, heteroalkyl, heteroalkenyl, or heteroalkinyl chains.

62. (WITHDRAWN)

The method according to claim 33, wherein the alkyl, alkenyl, alkinyl, heteroalkyl, heteroalkenyl, or heteroalkinyl chains have a chain length of 1 to 20 atoms.

63. (WITHDRAWN)
The method according to claim 34, wherein the alkyl, alkenyl, alkinyl, heteroalkyl, heteroalkenyl, or heteroalkinyl chains have a chain length of 1 to 14 atoms.

64. (PREVIOUSLY PRESENTED)
The method according to claim 56, wherein the nucleic acid oligomers or the modified nucleic acid oligomers are attached to the conductive surface covalently or by means of physisorption.

65. (WITHDRAWN)
The method according to claim 36, wherein one of the phosphoric-acid, carboxylic-acid, or amine moieties, one of the sugar moieties, or one of the bases of the nucleic acid oligomer or of the modified nucleic acid oligomer is attached to the conductive surface covalently or by means of physisorption, especially to a terminal moiety of the nucleic acid oligomer or of the modified nucleic acid oligomer.

66. (PREVIOUSLY PRESENTED)
The method according to claim 56, wherein the nucleic acid oligomers or the modified nucleic acid oligomers are covalently attached to branched or linear molecular moieties of any composition and chain length and these molecular moieties are attached to the conductive surface covalently or by mean so physisorption.

67. (WITHDRAWN)
The method according to claim 38, wherein the chain length of the branched or linear molecular moiety is 1 to 14 atoms.

68. (WITHDRAWN)
The method according to claim 38, wherein the branched or linear molecular moiety is covalently bound to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

69. (WITHDRAWN)
The method according to one of claim 30, wherein the chain length of the further chemical compound and the chain length of the branched or linear molecular moiety differ by a maximum of 8 atoms.

70. (WITHDRAWN)
The method according to claim 41, wherein the chemical compound and the branched or linear molecular moiety have the same chain length.

71. (PREVIOUSLY PRESENTED)
The method according to claim 56, wherein one or more kinds of nucleic acid oligomers in the form of the double-strand hybrid are bound to a conductive surface and only the nucleic acid oligomers bound to the conductive surface are modified by attaching a redox-active substance to the nucleic acid oligomers.

72. (WITHDRAWN)
The method according to claim 43, wherein the attachment of the redox-active substance to the nucleic acid oligomer occurs by means of reacting the redox-active substance with a phosphoric-acid moiety, a sugar moiety, or one of the bases of the nucleic acid oligomer, especially by means of reaction with a terminal moiety of the nucleic acid oligomer.

73. (WITHDRAWN)
The method according to claim 44, wherein the redox-active substance is covalently attached to a branched or linear molecular moiety of any composition and chain length and the branched or linear molecular moiety is attached to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

74. (WITHDRAWN)
The method according to claim 56, wherein the redox-active substance is a dye, especially a flavine derivative, a porphyrin derivative, a chlorophyll derivative, or a bacteriochlorophyll derivative.

75. (WITHDRAWN)
The method according to claim 56, wherein the redox-active substance is a quinone, especially a pyrrolo-quinoline quinone (PQQ), a 1,4-benzoquinone, a 1,2-naphthoquinone, a 1,4-naphthoquinone, or a 9,10-anthraquinone.

76. (WITHDRAWN)
The method according to claim 46, wherein the redox-active substance is covalently attached to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

77. (WITHDRAWN)
The method according to claim 46, wherein the redox-active substance is covalently attached to a branched or linear molecular moiety of any composition and chain length and the branched or linear molecular moiety is attached to one of the phosphoric-acid, carboxylic-acid, or amine moieties, to one of the sugar moieties, or to one of the bases of the nucleic acid oligomer, especially to a terminal moiety of the nucleic acid oligomer.

78. (WITHDRAWN)
The method according to claim 49, wherein the redox-active substance is covalently attached to a branched or linear molecular moiety whose shortest continuous link between joined structures comprises 1 to 14 atoms.

79. (WITHDRAWN)
The method according to claim 56, wherein the modified nucleic acid oligomer is a deoxyribonucleic acid oligomer, a ribonucleic acid oligomer, a peptide nucleic acid oligomer, or a nucleic acid oligomer having a structurally analogous backbone.

80. (WITHDRAWN)
The method according to claim 56, wherein the conductive surface consists of a metal or a metal alloy, especially a metal selected from the group platinum, palladium, gold, cadmium, mercury, nickel, zinc, carbon, silver, copper, iron, lead, aluminum, manganese, and their compounds.

81. (WITHDRAWN)
The method according to claim 56, wherein the conductive surface consists of a semiconductor, especially a semiconductor selected from the group carbon, silicon, germanium, and α-tin.

82. (WITHDRAWN)
The method according to claim 56, wherein the conductive surface consists of a binary compound of the elements of groups 14 and 16, a binary compound of the elements of groups 13 and 15, a binary compound of the elements of groups 15 and 16, or a binary compound of the elements of groups 11 and 17, especially a Cu(I)-halide or an Ag(I)-halide.

83. (WITHDRAWN)
The method according to claim 56, wherein the conductive surface consists of a ternary compound of the elements of groups 11, 13, and 16, or a ternary compound of the elements of groups 12, 13, and 16.

84. (NEW)

A method of producing a modified conductive surface, wherein a nucleic acid oligomer or a nucleic acid oligomer modified by attaching a redox-active substance that is selectively oxidizable and reducible at a potential φ with $2.0\ V \geq \varphi \leq -2.0\ V$, measured against normal hydrogen electrode, is hybridized with the nucleic acid oligomer strand complementary to the nucleic acid oligomer or the modified nucleic acid oligomer and applied to a conductive surface in the form of the double-strand hybrid, which is thermally dehybridized following application to the conductive surface.

85. (NEW)

The method according to claim 84, wherein the double-strand hybrid is applied to the conductive surface in the presence of further chemical compounds also attached to the conductive surface.

86. (NEW)

The method according to claim 84, wherein the nucleic acid oligomers or the modified nucleic acid oligomers are attached to the conductive surface covalently or by means of physisorption.

87. (NEW)

The method according to claim 84, wherein the nucleic acid oligomers or the modified nucleic acid oligomers are covalently attached to branched or linear molecular moieties of any composition and chain length and these molecular moieties are attached to the conductive surface covalently or by mean so physisorption.

88. (NEW)

The method according to claim 84, wherein one or more kinds of nucleic acid oligomers in the form of the double-strand hybrid are bound to a conductive surface and only the nucleic acid oligomers bound to the conductive surface are modified by attaching a redox-active substance to the nucleic acid oligomers.